



IFW

# PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of

Attn: OIPE

Paul BURT et al.

Application No.: 10/519,359

Docket No.: 122241

Filed: December 28, 2004

For: METHOD AND APPARATUS FOR LASER WELDING


## REQUEST FOR CORRECTION OF PALM RECORDS

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

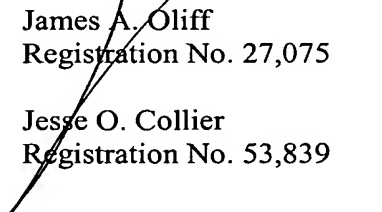
Sir:

Attached is a photocopy of the original filing receipt on which errors have been corrected in red. These errors are being brought to the attention of the Patent and Trademark Office so that it may correct its records. A copy of the Preliminary Amendment filed on December 28, 2004 is also enclosed.

Respectfully submitted,



James A. Oliff  
Registration No. 27,075



Jesse O. Collier  
Registration No. 53,839

JAO:JOC/cqc

Date: July 27, 2005

OLIFF & BERRIDGE, PLC  
P.O. Box 19928  
Alexandria, Virginia 22320  
Telephone: (703) 836-6400

DEPOSIT ACCOUNT USE  
AUTHORIZATION  
Please grant any extension  
necessary for entry;  
Charge any fee due to our  
Deposit Account No. 15-0461



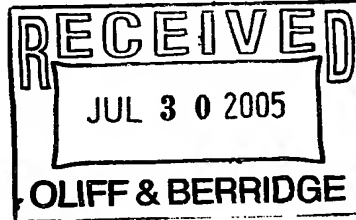
## UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPL NO.	FILING OR 371 (c) DATE	ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	DRAWINGS	TOT CLMS	IND CLMS
10/519,359	12/28/2004	1725	900	122241	2	20	2

CONFIRMATION NO. 2993

25944  
OLIFF & BERRIDGE, PLC  
P.O. BOX 19928  
ALEXANDRIA, VA 22320



## FILING RECEIPT



\*OC000000016254878\*

Date Mailed: 06/28/2005

Receipt is acknowledged of this regular Patent Application. It will be considered in its order and you will be notified as to the results of the examination. Be sure to provide the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION when inquiring about this application. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please mail to the Commissioner for Patents P.O. Box 1450 Alexandria Va 22313-1450. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections (if appropriate).

## Applicant(s)

Paul Burt, Bristol, UNITED KINGDOM;  
Anthony I Griffith, Bristol, UNITED KINGDOM;  
Andrew P Green, Bristol, UNITED KINGDOM;

**Power of Attorney:** The patent practitioners associated with Customer Number 25944.

## Domestic Priority data as claimed by applicant

This application is a 371 of PCT/GB03/02460 06/09/2003

## Foreign Applications

UNITED KINGDOM 0215269.2 07/03/2002

**Projected Publication Date:** To Be Determined - pending completion of Security Review

**Non-Publication Request:** No

**Early Publication Request:** No

## Title

~~Laser welding method and apparatus for suppressing plasma~~

Method and Apparatus for Laser Welding



**PATENT APPLICATION**

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of

Paul BURT et al.

**COPY**

Application No.: New U.S. National Stage of  
PCT/GB03/002460

Filed: December 28, 2004

Docket No.: 122241

For: METHOD AND APPARATUS FOR LASER WELDING

**PRELIMINARY AMENDMENT**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

Please consider the following:

**Amendments to the Specification;**

**Amendments to the Claims** as reflected in the listing of claims;

**Remarks.**

**Amendments to the Specification**

Please replace the title as follows:

~~LASER WELDING METHOD AND APPARATUS FOR SUPPRESSING~~  
~~PLASMA METHOD AND APPARATUS FOR LASER WELDING~~

Attached are a marked-up copy of the originally filed specification and a clean substitute specification in accordance with 37 C.F.R. §§1.121(b)(3) and 1.125(c). The substitute specification contains no new matter.

**Amendments to the Claims:**

The following listing of claims will replace all prior versions, and listings, of claims in the application:

Claims 1-28 (cancelled).

29. (New) Laser welding apparatus, in which a laser beam is impinged upon a component to be welded at a laser beam impingement point, wherein plasma suppression means is arranged to impinge a jet of gas on the component at an angle between about 38° and about 52° to its surface, flowing towards the laser beam impingement point, at a distance of at least 1mm from the laser beam axis, such that the gas is deflected across the laser beam.

30. (New) Laser welding apparatus as claimed in Claim 29 wherein the laser welding apparatus comprises a laser head to focus the laser beam on the laser beam impingement point, and there is provided a nozzle adjacent the laser head that, in use, provides a jet of high velocity gas over the laser head.

31. (New) Laser welding apparatus as claimed in Claim 29 wherein the apparatus further comprises a gas extraction means located adjacent the laser beam, diametrically opposite the plasma suppression means.

32. (New) Laser welding apparatus as claimed in Claim 29 wherein the plasma suppression means is adapted to supply gas to impinge the component at an angle of between about 38° and 52°.

33. (New) Laser welding apparatus as claimed in Claim 32 wherein the plasma suppression means is adapted to supply gas to impinge the component at an angle of about 45°.

34. (New) Laser welding apparatus as claimed in Claim 29 wherein the plasma suppression means is adapted to supply gas at a rate of between about 10 and 18 litres per minute.

35. (New) Laser welding apparatus as claimed in Claim 34 wherein the plasma suppression means is adapted to supply gas at a rate of about 14 litres per minute.

36. (New) Laser welding apparatus as claimed in Claim 29 wherein the plasma suppression means comprises tubular supply means.

37. (New) Laser welding apparatus as claimed in Claim 36 wherein the inner diameter of the tubular supply means is between about 6 mm and about 10 mm.

38. (New) Laser welding apparatus as claimed in Claim 29 wherein the gas supplied by the plasma suppression means is an inert gas.

39. (New) Laser welding apparatus as claimed in Claim 29 wherein the plasma suppression means is adapted to supply gas to impinge the component at a distance of between about 1 mm and about 5 mm from the laser beam.

40. (New) Laser welding apparatus as claimed in Claim 39 wherein the plasma suppression means is adapted to supply gas to impinge the component at a distance of about 4 mm from the laser beam.

41. (New) Laser welding apparatus as claimed in Claim 29 wherein the plasma suppression means is arranged such that the gas exits the suppression means at a distance from the component surface of between about 2 mm and about 5 mm.

42. (New) Laser welding apparatus as claimed in Claim 41 wherein the plasma suppression means is arranged such that the gas exits the suppression means at a distance from the component surface of about 2 mm.

43. (New) Laser welding apparatus as claimed in claim 30 wherein the nozzle is a spray head nozzle.

44. (New) Laser welding apparatus as claimed in Claim 30 wherein the high velocity gas exits the secondary supply means at, at least, 30 m/s.

45. (New) Laser welding apparatus as claimed in Claim 30 wherein the exit nozzle comprises a row of small tubular outlets.

46. (New) A laser welding apparatus as claimed in Claim 31 wherein the gas extraction means lies between about 2 mm and about 5 mm from the surface of the component.

47. (New) A method of laser welding a component the steps of, focusing a laser beam on substrate component, moving the component relative to the laser beam such that the laser beam impingement point moves in a welding direction, and supplying a plasma suppression gas to impinge the component adjacent the laser beam impingement point, wherein the gas flow is arranged to impinge the component at an angle of between 30° and about 60° to the component surface, and at a distance from the laser beam of at least 1 mm.

48. (New) A method of laser welding a component as claimed in Claim 47 wherein the plasma suppression gas is supplied to impinge at a point that lies behind the laser impingement point in the welding direction.



**REMARKS**

Claims 29-48 are pending in this application. By this Amendment, the title and specification are amended. Claims 1-28 are cancelled. Claims 29-48 are new.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,

**COPY**

James A. Oliff  
Registration No. 27,075

Eric D. Morehouse  
Registration No. 38,565

JAO:EDM/cqc

Date: December 28, 2004

**OLIFF & BERRIDGE, PLC**  
**P.O. Box 19928**  
**Alexandria, Virginia 22320**  
**Telephone: (703) 836-6400**

<p><b>DEPOSIT ACCOUNT USE AUTHORIZATION</b> Please grant any extension necessary for entry; Charge any fee due to our Deposit Account No. 15-0461</p>
---

Attachment: Substitute Specification with marked-up and clean versions